

### CLAIMS

Now, therefore, at least the following is claimed:

- 1           1.       A system, comprising:  
2               a plurality of nodes communicating signals pursuant to a single channel plan,  
3               said channel plan having predefined characteristics for each of a plurality of signal  
4               channels;  
5               a spectrum analyzer;  
6               a switch capable of connecting one of said nodes with said spectrum analyzer;  
7               and  
8               a controller controlling said switch to select said one node, said controller  
9               capable of monitoring communication of signals on said nodes by conducting a test  
10              plan, said test plan prescribing performance of at least one test, said test plan further  
11              configured with at least one alarm limit, the controller further configured to compare  
12              results from said at least one test with said alarm limit, the controller further  
13              configured to control said spectrum analyzer to perform a failure time spectrum scan  
14              when at least one test result exceeds said alarm limit to generate a plot of power  
15              amplitude versus frequency over the frequency spectrum of said node.
- 1           2.       The system of claim 1, further comprising a database, wherein said  
2               controller is further configured to store said failure time spectrum scan to the database.
- 1           3.       The system of claim 1, wherein the controller is further configured to  
2               control the spectrum analyzer to perform a failure time spectrum scan over the entire  
3               frequency spectrum of said one node.
- 1           4.       The system of claim 1, wherein said nodes are part of a cable television  
2               network.

1           5.       The system of claim 1, further comprising:  
2                   a graphical user interface, wherein said controller is configured to  
3 retrieve and communicate said failure time spectrum scan from said database to said  
4 graphical user interface for displaying said failure time spectrum scan in response to a  
5 user request.

1           6.       The system of claim 1, wherein said at least one test is selected from the  
2 group consisting of total node power, carrier-to-noise power, percent availability,  
3 average noise power, channel power, and burst counter.

1           7.       The system of claim 5, wherein said user request is communicated to  
2 said controller via said graphical user interface.

1           8.       The system of claim of claim 5, wherein said controller is further  
2 configured to permit a user to configure said spectrum analyzer to repeat the failure  
3 time spectrum scan in response to a user request.

1           9.       The system of claim 8, wherein said spectrum analyzer is configured to  
2 perform said repeat of said failure time spectrum scan with the same spectrum analyzer  
3 configuration.

1           10.      The system of claim 9, wherein said user request is communicated to  
2 said controller via said graphical user interface.

1           11.      The system of claim 2, wherein said controller is further configured to  
2 control said spectrum analyzer to perform said failure time spectrum scan wherein said  
3 failure time spectrum scan is performed over a portion of said one node's frequency  
4 spectrum.

1           12.      The system of claim 11, wherein said controller controls said spectrum  
2 analyzer in response to said test plan.

1           13.     The system of claim 12, wherein said controller controls said response  
2 to said test plan by adjusting the start and stop frequencies sent to configure said  
3 spectrum analyzer based on the channel under test at the time said alarm limit was  
4 exceeded.

1           14.     A computer readable medium having a program for enabling efficient  
2 monitoring of electrical signals communicated along a plurality of nodes, each node  
3 having a plurality of signal channels, the signals being measured by a spectrum  
4 analyzer, the program comprising:

5                 means for receiving signal data sampled by the spectrum analyzer; and

6                 means for testing communication of said signals on at least one of said nodes  
7 by conducting a test plan on said signal data, said test plan prescribing measurement of  
8 at least one test on at least one node, said means for testing further configured to  
9 compare said test results with an alarm limit and to control said spectrum analyzer to  
10 perform a failure time spectrum scan when said test results exceed said alarm limit,  
11 said failure time spectrum scan representative of power amplitude versus frequency  
12 over the frequency spectrum of said node.

1           15.     A method for recording the frequency spectrum of electrical signals  
2 communicated along a plurality of electrical connections, each connection having a  
3 plurality of signal channels, comprising:

4                 communicating said signals along each of said plurality of said nodes;

5                 testing communication of said signals on said nodes by conducting a test plan,  
6 said test plan prescribing measurement of at least one test on at least one node;

7                 comparing results from said one test with a user definable alarm limit; and

8                 performing a failure time spectrum scan on said one node when said test results  
9 exceed said alarm limit, said failure time spectrum scan representative of power  
10 amplitude versus frequency over the frequency spectrum of said node.

1           16.     The method of claim 15, further comprising the step of storing said  
2 failure time spectrum scan to a database.

1           17.     The method of claim 16, further comprising the step of communicating  
2     said failure time spectrum scan to a graphical user interface and displaying said failure  
3     time spectrum scan on a screen.

1           18.     The method of claim 16, wherein said failure time spectrum scan is  
2     performed in response to said test plan by adjusting the start and stop frequencies of  
3     said failure time spectrum scan based on the channel under test at the time said alarm  
4     limit was exceeded.

1           19.     The method of claim 17, wherein the step of communicating is  
2     performed in response to a user request.

          20.     The method of claim 19, wherein said user request is entered via said  
graphical user interface.